
SYSTEMC™
SystemC
Community Update
Eric Lish, OSCI Chair
February 28, 2011


Thanks to Our Global Sponsors
ARM
cadence™
FORTE
DESIGN SYSTEMS
Mentor Graphics®
SYNOPSYS®
XtremeEDA
SYSTEMC™
2

Outline

- Update on the OSCI organization, events and activities
- Technical Working Group updates
  - Synthesis Working Group (SWG)
  - Language Working Group (LWG)
  - Transaction-Level Modeling (TLM-WG)
  - Analog/Mixed-Signal (AMS-WG)
  - Configuration, Control and Inspection (CCI-WG)
- IEEE P1666 Update
- Media Site: technical tutorials and user videos available media.systemc.org

SYSTEMC™

3

OSCI Membership

Corporate Members

ARM, cadence, FORTE DESIGN SYSTEMS, intel, Mentor Graphics, NXP founded by Philips, ST, SYNOPSYS®

Associate Members

Actis, ATRENTA, BROADCOM, Canon, carbon design systems, CISC semiconductor, CoFluent Design, DOULOS, Fraunhofer Institut Integrierte Schaltungen, 創意電子 GLOBAL UNICHIP CORP, GreenSocs, infineon, Industrial Technology Research Institute, JEDA, mde MapleDesign Automation, NEC, OFFIS, QUALCOMM, STARC, Texas Instruments, Université Pierre & Marie Curie, XtremeEDA

30 members

SYSTEMC™

4

Broad-based User Community

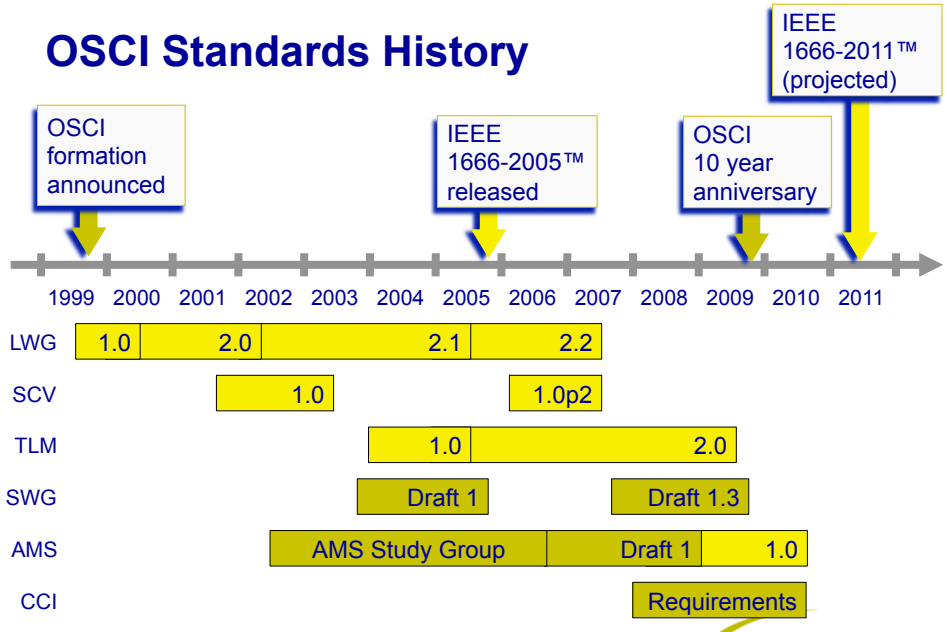
- SystemC User groups are worldwide and active
  - European SystemC User Group
  - Annual SystemC Users meeting in Japan
  - North America SystemC User Group
  - Latin America SystemC User Group in Brazil
  - India SystemC User Group
  - Taiwan SystemC User Group

Find out more:
http://www.systemc.org/community/user_groups/

SYSTEMC™

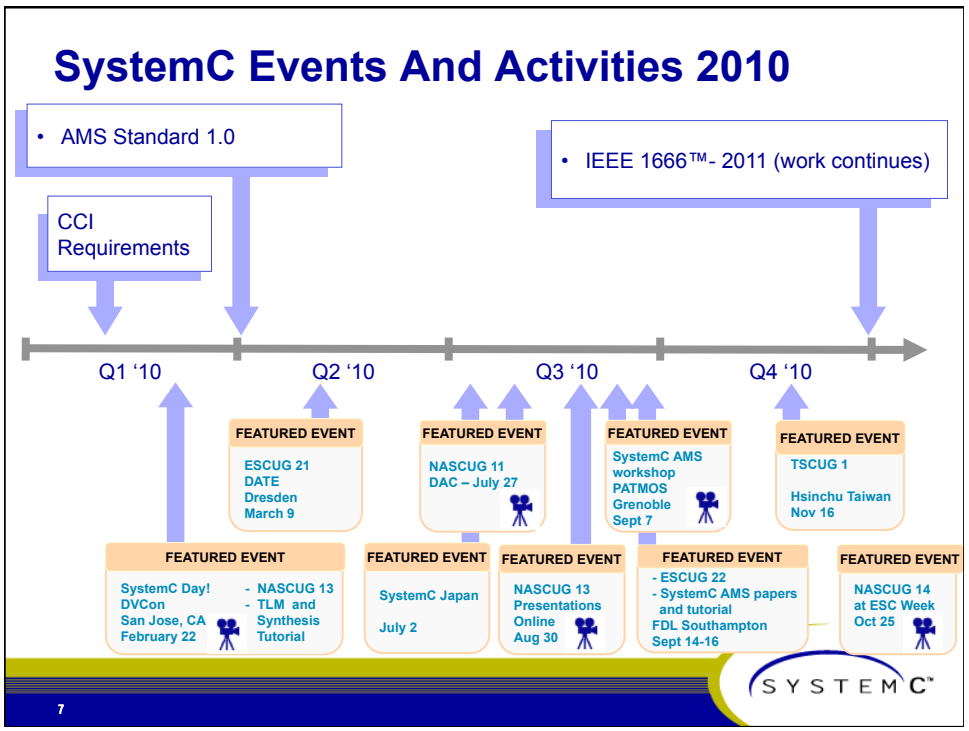
5

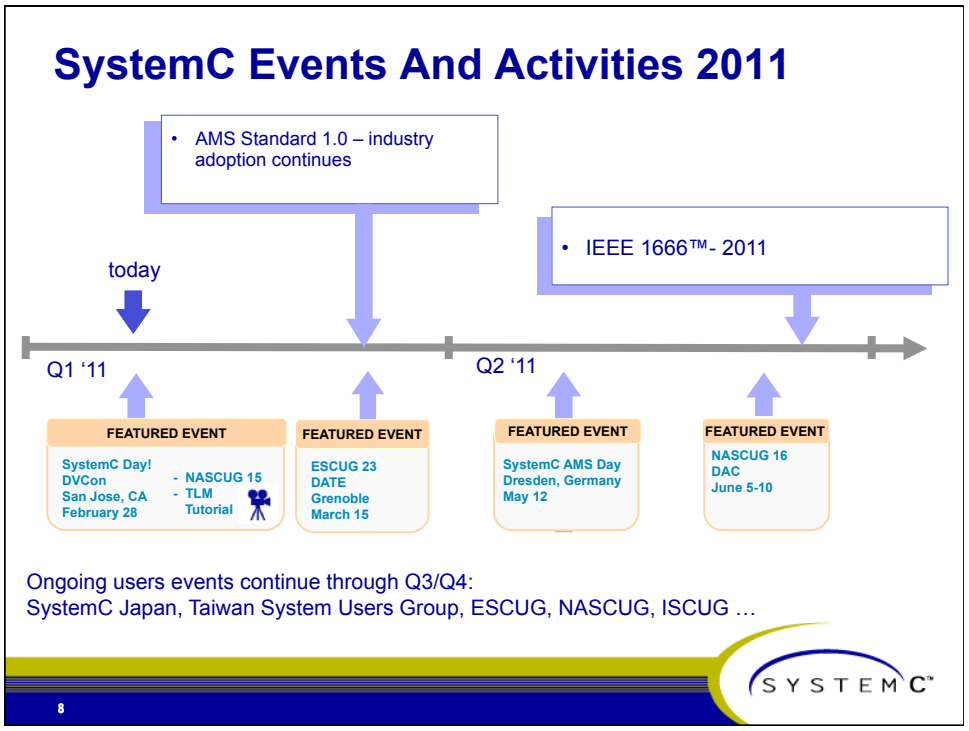
OSCI Standards History



SYSTEMC™

6


SystemC Events And Activities 2010
• AMS Standard 1.0
CCI Requirements
• IEEE 1666™- 2011 (work continues)
Q1 '10
Q2 '10
Q3 '10
Q4 '10
FEATURED EVENT
SystemC Day!
DVCon
San Jose, CA
February 22
- NASCUG 13
- TLM and Synthesis Tutorial
FEATURED EVENT
ESCUG 21
DATE
Dresden
March 9
FEATURED EVENT
SystemC Japan
July 2
FEATURED EVENT
NASCUG 11
DAC – July 27
FEATURED EVENT
NASCUG 13
Presentations
Online
Aug 30
FEATURED EVENT
SystemC AMS workshop
PATMOS
Grenoble
Sept 7
FEATURED EVENT
- ESCUG 22
- SystemC AMS papers and tutorial
FDL Southampton
Sept 14-16
FEATURED EVENT
TSCUG 1
Hsinchu Taiwan
Nov 16
FEATURED EVENT
NASCUG 14
at ESC Week
Oct 25
SYSTEMC™
7


SystemC Events And Activities 2011
• AMS Standard 1.0 – industry adoption continues
today
• IEEE 1666™- 2011
Q1 '11
Q2 '11
FEATURED EVENT
SystemC Day!
DVCon
San Jose, CA
February 28
- NASCUG 15
- TLM Tutorial
FEATURED EVENT
ESCUG 23
DATE
Grenoble
March 15
FEATURED EVENT
SystemC AMS Day
Dresden, Germany
May 12
FEATURED EVENT
NASCUG 16
DAC
June 5-10
Ongoing users events continue through Q3/Q4:
SystemC Japan, Taiwan System Users Group, ESCUG, NASCUG, ISCUG …
SYSTEMC™
8

Synthesis WG Update

- Public review of draft 1.3 completed March 2010
  Updates include:
  - Supported language constructs established
  - Added section on processes, clocks, resets
  - Added discussion on abstraction levels to introduction
  - Simplified and clarified
- Currently updating in anticipation of IEEE 1666-2011
- OSCI TLM-2.0 Standard and Synthesis Subset Video Tutorial: http://media.systemc.org/

Chair: Andres Takach, Mentor
Vice-Chair: Mike Meredith, Forte

SYSTEMC™

9

Language WG Update

- Interest in IEEE 1666 Standard continues strong
  - 27,793 total downloads of IEEE 1666-2005 LRM
  - 4217 downloads Jan 1, 2009 to May 31, 2009
- Current LWG activity
  - Working on changes to proof-of-concept implementation in anticipation of IEEE 1666-2011

Chair: David Black, XtremeEDA

SYSTEMC™

10

Transaction-Level Modeling WG Update

- TLM-2.0 will be incorporated in the new IEEE P1666 SystemC standard
- Encompasses:
  - Approximately Timed (AT) & Loosely Timed (LT) modeling
  - Temporal Decoupling
  - Direct Memory Interface
  - Debug Transactions
  - Extensible Base Protocol for modeling memory mapped buses
- Adoption of TLM-2.0 by Accellera for new UVM 1.0 Standard
- Many video resources available: TLM-2.0 in Action and more

Chair: Bart Vanthournout, Synopsys
Vice-Chair: James Aldis, Texas Instruments

11

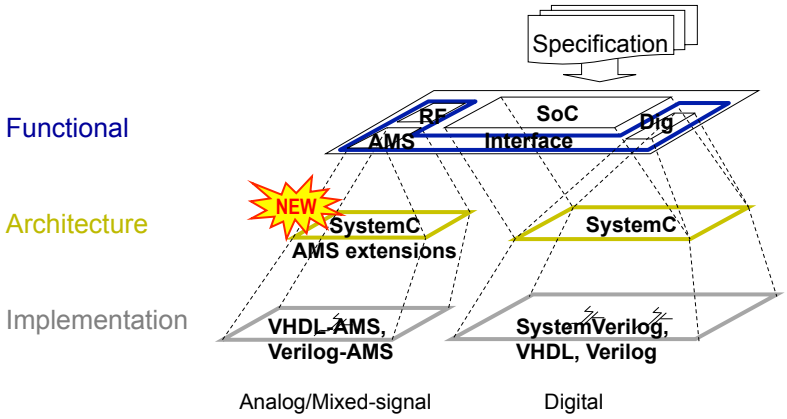
Analog/Mixed-Signal WG Update

- Public review of the AMS Draft 1 kit completed in March 2009
  The kit includes:
  - Draft LRM and requirements specification
  - Whitepaper "An Introduction to Modeling Embedded Analog/Mixed-Signal Systems using SystemC AMS extensions"
- SystemC AMS 1.0 Standard released in March 2010
  - Updated LRM and requirements specification; User's Guide including guidelines for AMS model creation and modeling strategy
- SystemC AMS Day – Grenoble, May 12,2011
  - Industry-driven: organized by NXP, ST, Infineon and Fraunhofer and supported by OSCI
  - Highlights the application of the SystemC AMS 1.0 compatible proof-of-concept implementation for various applications.

Chair: Martin Barnasconi, NXP Semiconductors
Vice-Chair: Christoph Grimm, Vienna University of Technology

12

SystemC-AMS Will Supply The Missing Abstraction



13

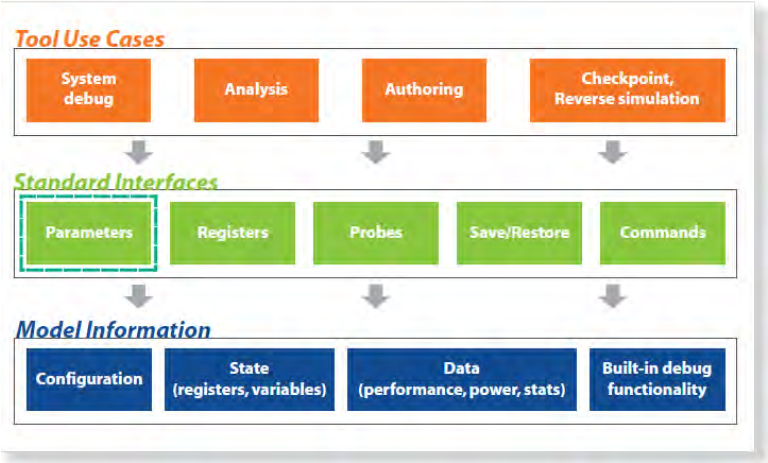
Configuration, Control, & Inspection WG Update

- The WG's scope is being addressed in an incremental fashion, beginning with Configuration
- Public review of the Configuration requirements specification was completed in April, 2010
- A preliminary definition of the standard has been completed in accordance with the requirements specification and feedback from its public review
- The following collateral is being prepared to validate the preliminary standard and facilitate public review of a draft standard:
  - LRM; detailed documentation
  - Examples to illustrate key concepts and capabilities

14

Configuration, Control & Inspection WG

Standardizing interfaces between models and tools



Chair: Trevor Wieman, Intel
Vice-Chair: Bart Vanthournout, Synopsys

SYSTEMC™

15

IEEE P1666 Goals And Charter

- **Charter is to update the 1666-2005 SystemC Standard**
  - **Errata to 1666-2005**
  - **Clarifications to 1666-2005 standard**
  - **Better formalization of TLM 1.0 Message Passing Interface**
  - **Add OSCI TLM-2.0 LRM**
  - **Selected new features**
- **Goal is to**
  - **Create/ballot draft P1666-2011 standard in during 2010**
  - **Send the approved standard to RevCom in early 2011**
- **Chair: Stan Krolikoski (stanleyk@cadence.com)**

IEEE

IEEE P1666 Draft Standard Available
www.eda.org/systemc

IEEE Celebrating 125 Years of Engineering the Future

P1666 SystemC WG
In Coordination With OSCI

Welcome to the IEEE P1666 website

P1666 Charter

The general charter of this project is to provide a C++-based standard for designers and architects who need to address complex systems that are a hybrid between hardware and software.

The specific charter of this standard is to provide a precise and complete definition of the SystemC class library including a Transaction Level Modeling library so that a SystemC implementation can be developed with reference to this standard alone. This standard is not intended to serve as a users guide or to provide an introduction to SystemC, but does contain useful information for end users.

P1666 Member Entities

Accellera
Cadence
Freescale
Intel
JEITA
Mentor
NXP
OSCI
ST Micro
STARC
Synopsys
Texas Instruments

IEEE

17

OSCI Media: Technical Tutorials

OSCI TLM-2.0 Standard and Synthesizable Subset

John Aynsley, Doulos; Michael McNamara, Cadence; Michael Meredith, Forte

TLM-2.0 in Action: An Example-based Approach to TLM and the New World of Model Interoperability

John Aynsley, Doulos; David Black, XtremeEDA
Zhu Zhou, Intel; Frank Schirrmeister, Synopsys

Using TLM Extensions for Bus Locking and Snooping

John Aynsley, Doulos

Available at: http://media.systemc.org

SYSTEMC™

18

OSCI Media: NASCUG Presentations

NASCUG 13

Umesh Sisodia, CircuitSutra; Jiong Ou, TU Wien; Bill Bunton, LSI; John Aynsley, Doulos; Tim Kogel, Synopsys

SystemC Day 2010 / NASCUG 12

Keynote by Gary Smith, Gary Smith EDA; Jack Donovan, HighIP Design; Hervé Alexanian, Sonics; Samuel Goto, UNICAMP; David Black, XtremeEDA; Brian Bailey, consultant

NASCUG 11

Luca Ferro, TIMA Laboratory; Karsten Einwich, Fraunhofer IIS/EAS; David Black, XtremeEDA; William Gnadt, Lockheed Martin

Available at: http://media.systemc.org

SYSTEMC™

19

OSCI Media: Coming Soon

SystemC Day 2011

Jim Hogan

Keynote: "Navigating the SoC Era"
Jim Hogan, Private Investor, Vista Ventures, LLC

NASCUG 15 User Presentations

- Low-cost SystemC Acceleration on Multi-core GNU/Linux Platforms
- TLM Methodology to Enable Architecture Exploration via Co-simulation of SystemC Models with Legacy C/C++ Models
- The New IEEE 1666 SystemC Standard
- A Common System Memory Model for SoC Software and Architecture Models using a SystemC/TLM-2.0 Interface

Tutorial: "Software-Driven Verification Using TLM-2.0 Virtual Platforms"
John Aynsley, Doulos; Bill Bunton, LSI Corp; Volkan Esen, Infineon Technologies; Trevor Wieman, Intel Corp; David Black, XtremeEDA Corp.

Available at: http://media.systemc.org

SYSTEMC™

20

Summary

- OSCI continues to advance the ESL community with SystemC standards
- Next generation SystemC Standard: draft P1666 LRM was approved by the working group; balloting group being formed
- TLM-2.0 is everywhere!
  - Now being incorporated as significant part of IEEE 1666 standard
  - Adoption of TLM-2.0 for new UVM 1.0 Standard
- SystemC AMS 1.0 released in March 2010
- Configuration, Control & Inspection WG is preparing collateral to enable a draft Configuration standard public review
- Technical user presentations and videos available http media.systemc.org

Visit www.systemc.org for details!

SYSTEMC™

21